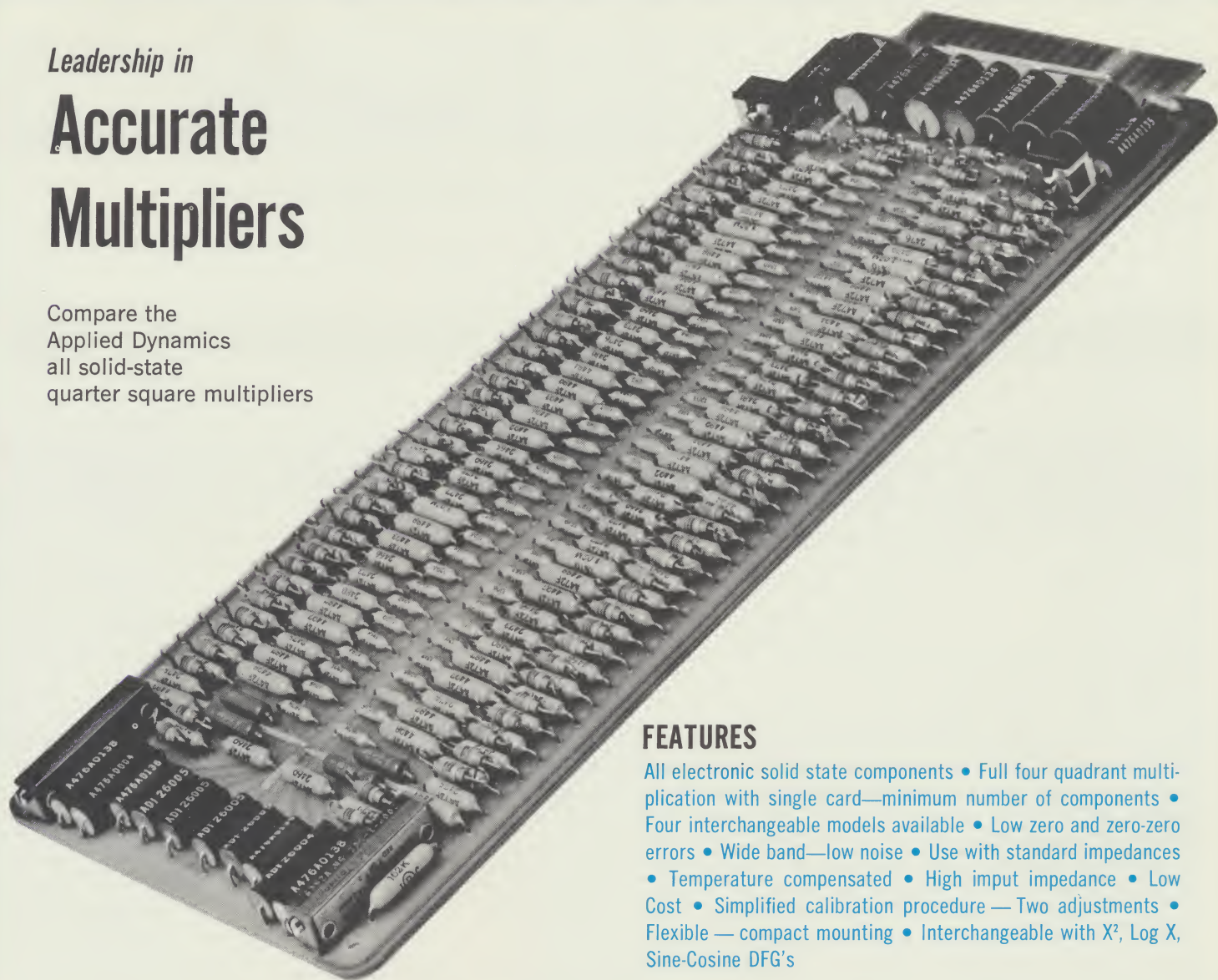


Leadership in

Accurate Multipliers

Compare the
Applied Dynamics
all solid-state
quarter square multipliers



FEATURES

- All electronic solid state components
- Full four quadrant multiplication with single card—minimum number of components
- Four interchangeable models available
- Low zero and zero-zero errors
- Wide band—low noise
- Use with standard impedances
- Temperature compensated
- High input impedance
- Low Cost
- Simplified calibration procedure — Two adjustments
- Flexible — compact mounting
- Interchangeable with X^2 , Log X, Sine-Cosine DFG's

Representative of the superior performance provided is the

New 168 $(\frac{1}{4})^2$ Multiplier

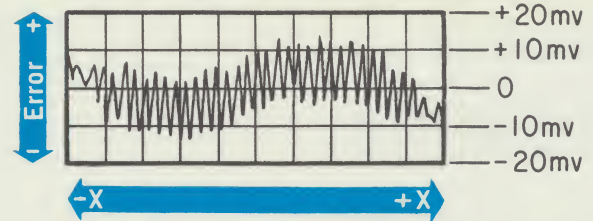
Using 37 diode segments per quadrant, this multiplier is capable of producing an output product over the entire range of both inputs with a typical maximum static error of just 12 millivolts. Input signals are $\pm X$ and $\pm Y$ over the range of ± 100 volts. Despite the larger number of diode segments, unique circuit features in the Model 168 allow the same outstanding specifications characteristic of all Applied Dynamics multipliers. As with all non-linear components manufactured by AD the Model 168 has outstanding low input current requirements — maximum current for each input is only 3 milliamperes.

SPECIFICATIONS

QUARTER SQUARE MULTIPLIERS

All specifications using AD amplifiers or equivalent.

TYPICAL MODEL E3.168 MAXIMUM STATIC ERROR CURVE
FOR $Y = +100$ volts $-100 \text{ volts} < X < +100 \text{ volts}$

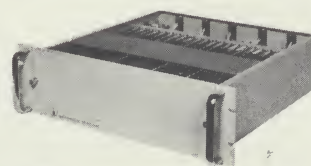


| Model Number | E3.164.2 | E3.166.1 | E3.158 | E3.168 |
|---|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Accuracy | 0.15% | 0.035% | 0.025% | 0.015% |
| Input Voltage | $\pm X, \pm Y$ | $\pm X, \pm Y$ | $\pm X, \pm Y$ | $\pm X, \pm Y$ |
| Input Voltage Range | $ X + Y \leq 200$ | $ X + Y \leq 200$ | $ X + Y \leq 200$ | $ X + Y \leq 200$ |
| Output Scaling | $-XY/100$ | $-XY/100$ | $-XY/100$ | $-XY/100$ |
| Maximum Static Error | $< \pm 300 \text{mv}$ | $< \pm 70 \text{mv}$ | $< \pm 50 \text{mv}$ | $< \pm 30 \text{mv}$ |
| Zero Error $X=0, Y=100$ $Y=0, X=100$ | $< \pm 70 \text{mv}$ | $< \pm 20 \text{mv}$ | $< \pm 15 \text{mv}$ | $< \pm 10 \text{mv}$ |
| Zero Zero Error | $< \pm 10 \text{mv}$ | $< \pm 2 \text{mv}$ | $< \pm 2 \text{mv}$ | $< \pm 2 \text{mv}$ |
| Phase Shift @ 100 cps $X = \pm 100, Y = 100 \sin \omega t$ $Y = \pm 100, X = 100 \sin \omega t$ | 0.05° | 0.05° | 0.05° | 0.05° |
| Output Noise pk to pk (0 to 30Kc) | $< 15 \text{mv}$ | $< 15 \text{mv}$ | $< 15 \text{mv}$ | $< 15 \text{mv}$ |
| Input Impedance | $> 30 \text{K}$ | $> 30 \text{K}$ | $> 35 \text{K}$ | $> 35 \text{K}$ |
| Number of Adjustments | Two | Two | Two | Two |
| Temperature Coefficient | $3 \text{mv}/^\circ\text{F}$ | $2 \text{mv}/^\circ\text{F}$ | $2 \text{mv}/^\circ\text{F}$ | $2 \text{mv}/^\circ\text{F}$ |
| Reference Voltage | $\pm 100 \text{ volts}$ @3.0 Ma | $\pm 100 \text{ volts}$ @4.5 Ma | $\pm 100 \text{ volts}$ @3.0 Ma | $\pm 100 \text{ volts}$ @3.0 Ma |
| Physical Size (inches) | $4 \times 11 \times 3/4$ | $4 \times 11 \times 3/4$ | $4 \times 11 \times 3/4$ | $4 \times 11 \times 3/4$ |

INTERCHANGEABILITY

The Model 168 is mounted on a 4" x 11" etched-circuit card which is completely interchangeable with all other AD multipliers and fixed DFG's. As with all AD solid state quarter square multipliers and fixed function generators, the Model 168 multiplier's are compatible with any analog computer system which uses ± 100 volts for the reference. Mounting units compatible with all makes of computing systems are

available from AD. Also available is the unique AD multiplier overload system which indicates overloads based on $|X| + |Y| = 200 \text{ V}$



D9.260.1
19" Rack Mount Chassis, 20 Card Capacity



D9.261.1
Mounting Chassis, 3 Card Capacity for
Electronic Associates, Inc. Computers



APPLIED DYNAMICS

SHOWALTER - JUDD, INC.

Electronic Engineering Representatives
1806 SOUTH BUSH PLACE SEATTLE 44, WASHINGTON
EAst 4-7911

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